

REMARKS

After entry of this Amendment, claims 11-20 are cancelled to reduce the issues. Claims 1-10 are pending in the application. Reconsideration of the application as amended is requested.

Claims 1 - 5, 10- 13, 15 and 20 stand rejected as being anticipated by Sugarman et al. However, we submit that the apparatus disclosed in Sugarman does not anticipate claim 1 or claim 10, because the planar surface disclosed therein is not capable maintaining contact with the sole of the foot to apply pressure thereto while the foot is inverted and everted.

The Applicant believes that the apparatus which is the subject matter of the present application is fundamentally different from the prior art to which the Examiner has referred in the Final Office Action. The present invention relates to an orthopaedic apparatus and a method for use of the apparatus in taking a mold of a foot for the purposes of correcting biomechanical abnormalities, congenital deformities and abnormal positions of the foot acquired through accident or disease processes. Examples of such conditions are flat footedness, hypermobility and Rheumatoid Arthritis.

It is a particular requirement of the apparatus in accordance with claim 1 that the planar surface is able to maintain contact with and apply pressure to the sole of the foot when the foot is in an inverted or an everted condition. In this respect, the apparatus may be used to manipulate the foot to alter the angle of inversion or eversion or may simply be used to apply a dorisflectory pressure to the sole of the foot in order to push the forefoot upwardly toward the shin, while the foot is in its relaxed inverted or everted state.

Inversion and eversion are terms of the art which refer to the sole of the foot turning inwardly and outwardly respectively. This movement is shown in the attached Appendices and in the previous Amendment.

When the foot is inverted or everted, it pivots about a joint called the subtalar joint which is located just below the ankle and the sole moves in an arc

Date December 8, 2003

Reply to Office Action dated: October 6, 2003

about the subtalar joint. The approximate position of the subtalar joint is shown on the attached diagrams and the arrows indicate the arcuate movement of the sole. This movement can be simulated by placing the sole of your foot flat on the floor and rolling your ankle over to the left or right. It will be seen that this requires the sole to lift from the ground on one side or the other as the foot is either inverted or everted.

In order for the apparatus to be capable of inverting and everting the foot as is required in claim 1 of the present application, it is necessary that the planar surface is able to follow the complex arcuate movement of the sole as the foot is inverted and everted, so that the planar surface can maintain contact with the sole and apply pressure thereto. In the embodiment shown in Figures 1 and 2 of the present application, for example, the member 20 having the planar surface 21 is able to move about a vertical axis marked X in Figure 2, as well as several horizontal hinges, 22, 24, and 26. This enables the planar surface 21 to be moved in an arc about the subtalar joint while maintaining contact with the sole.

Claim 1 of the present application requires the apparatus to have:

"operating means provided on the opposite side of the said member to said planar surface for operation of the member in the pressure application of the planar surface into contact with the at least portion of the sole, **said operating means further providing means for inverting and everting the planar surface of the member while the planar surface is in contact with the at least portion of the sole for inverting and everting the foot..**" (emphasis added)

In the Final Office action, the Examiner has objected that claim 1 lacks novelty over Sugarman et al. and has identified the "operating means" as being the locking knob 31, and the ball joint 30 as shown in Figure 2. However, we submit the locking knob 31 and the ball joint 30 are not capable of moving the foot engaging plate 21 in a manner that would enable the foot to be inverted and everted while maintaining the plate 21 in contact with the sole to apply pressure thereto.

Date December 8, 2003**Reply to Office Action dated: October 6, 2003**

From Figures 2 and 3 of Sugarman et al., it can be seen that the ball joint 30 is provided to allow the foot engaging plate 21 to pivot about the axis of the ball joint in a vertical plane. This enables the position of the plate 21 to be adjusted to move the forefoot towards or away from the shin. No other movement is shown or described. Furthermore, with reference to Figures 1, 2, and 4, it can be seen that the ball joint 30 is located downwardly, away from the sole of the foot. Thus, even if the foot plate 21 were to be pivoted in a lateral direction, for which there is no disclosure, it would move in an arc about the axis of the ball joint, taking the plate 21 away from the sole of the foot. Thus, the foot engaging plate 21 cannot be moved by means of the ball joint 30 and the locking knob 31 in an arc about the subtalar joint as would be necessary to invert and evert the foot while maintaining the plate 21 in contact with the sole. Attached is a copy of Figure 4 of the Sugarman patent, Appendix A, to which we added a line X to indicate the axis of rotation of the ball joint 30 and arrows A which indicate the movement of the foot engaging plate about the axis in a horizontal plane.

From above, it can be seen that the apparatus disclosed in Sugarman does not have all the features required in claim 1 of the present application. Furthermore, there is nothing in Sugarman or in any of the other prior art documents which would lead a person of ordinary skill in the art to consider modifying the apparatus disclosed in Sugarman to enable it to be used to invert and evert a foot.

As regards claim 10 of the present application, it is submitted that even if it could be argued that the apparatus disclosed in Sugarman did have all the features set out in claim 1, there is nothing in the art to consider using the apparatus for the purposes of taking orthotic molds by inverting and everting the member having a planar surface, in accordance with the method of claim 10. Sugarman is concerned with apparatus for supporting a patient's lower leg while a fracture to the tibia or ankle is operated on and for applying a cast to support the lower leg and ankle while the fracture heals. This is a completely different technical field from that of the present invention which is concerned with the treatment and correction of

Date December 8, 2003

Reply to Office Action dated: October 6, 2003

deformities of the foot by taking molds. There is no suggestion in Sugarman that the apparatus disclosed might have application in this field.

It is respectfully submitted, therefore, that claims 1 - 10 of the present application are both novel and inventive over Sugarman et al.

In this submission, the Applicant hereby adduce evidence that the terms "inverting" and "everting" should be limited to their medical definitions and that it would be commonly accepted that these terms be limited to their medical definitions, in particular when being used to describe the movement of a foot with respect to foot orthoses.

The Applicant hereby provides evidence to show that the definitions of the terms "inversion" and "eversion" are generally accepted in the art as having their medical definitions. To this end, please find enclosed extracts from several published reference documents, which indicate that it is commonly accepted to limit the terms "inverting" and "everting" to only their medical definitions.

The first extract is taken from 'FOOT ORTHOSES and Other Forms of Conservative Foot Care' (Thomas C. Michaud), published by Michaud (Appendix B). As can be inferred from the title, the teaching of this reference is mainly directed towards the correction of feet using foot orthoses. The first set of Figures in the reference are used to illustrate universally accepted elementary biomechanical definitions. The movement of inversion and eversion in the frontal plane of the foot is shown clearly in Figure 1.4, in which the sole of the foot is rotated inwardly or outwardly. On the basis of this reference alone, it should be clear that use of the terms inversion and eversion, or "inverting" and "everting", in describing movement of the device for the production of a foot orthotic would be understood by the skilled addressee as being limited to the biomechanical movement shown in Figure 1.4.

The second extract is taken from "Biomechanical Basis of Human Movement" 2nd Edition (Joseph Hamill and Kathleen M. Knutzen), published by Lippincott Williams & Wilkins (Appendix C). The last paragraph on page 18 refers to a "set of specialized movements called inversion and eversion." Thus, it should be

Date December 8, 2003**Reply to Office Action dated: October 6, 2003**

understood that the use of these terms, in particular in the context of foot orthotics, would be limited to a specialized definition. Inversion is defined as taking place when the "medial border of the foot lifts so that the sole of the foot faces towards the other foot", with "eversion" being described as the opposite movement. Clearly, these definitions affirm in words the movements shown in Figure 1.4 of the above reference (Michaud). It should be clear that the use of these "specialized" terms in describing movement of the device in the production of a foot orthotic would be understood by the skilled addressee as being limited to the biomechanical movement shown in Figure 1.4.

A third extract is taken from "BIOMECHANICAL EXAMINATION OF THE FOOT" (Root, Orien, Weed & Hughes), published by Clinical Biomechanics Corporation (Appendix D). The relevant passages from page 6 have been reproduced, in which is stated that inversion is motion occurring in the frontal plane, during which the plantar surface of the foot or part of the foot is tilted so as to face more towards the midline of the body, with eversion acting to cause the plantar surface to face further away from the midline of the body. This definition is wholly in line with the teaching of the application and the above mentioned extracts.

Finally, please also find attached print outs from two different U.S. websites (Appendix E), each showing the movement of inversion and eversion corresponding to the definitions illustrated or set out in the above extracts. The Examiner's attention is drawn to the printout from the foot max website in particular, which in Figure 1.4 shows the anatomical planes in relation to the foot. Paragraph 2 on the second page goes on to explain that "inversion" and "eversion" are movements that occur in the frontal plane. The Examiner should also note the further definition of the terms which appear in paragraph 7.b. on page 3, which refers to the foot being "tilted" parallel to the frontal plane.

Thus, it is submitted that inversion and eversion are specific terms of art and that their use in the context of the present invention would be accepted as being limited to their medical definition.

Date December 8, 2003**Reply to Office Action dated: October 6, 2003**

Applicant also submit that it is evident from the originally filed specification that the terms "inverting" and "everting" were intended to be limited to their accepted medical definitions. As set out on page 1 of the application as originally filed, the present invention relates to a device and a method for use of the device in taking a mould of a foot, for the purposes of correcting biomechanical abnormalities, congenital deformities and abnormal positions of the foot acquired through accident or disease processes. The device has application in the specific medical field of orthopaedic treatment, and the specification is couched in medical terms specific to this field, for example "dorsiflexion", "subtalar", "metatarsophalangeal", "frontal plane", "inverting" and "everting". As has already been shown above, the terms "inverting" and "everting" are generally accepted as being limited to their medical definitions when used in the context of foot orthoses and Applicant submit that it would be clear to a person of ordinary skill in the art that the use of these specialized terms in the specification as filed was intended to be limited to the medical definitions.

Although the claims as originally filed were couched in terms of "tilting" the sole of the foot, it is clear that references to tilting or degrees of tilt of the foot in the application as filed referred to movement of the foot in the frontal plane, which is consistent with the definition of the terms "inversion" and "version" as set out in the documents referred to above and in particular the definition set out in the third extract which uses the term "tilted". In this regard, please see the description as filed on page 3 at lines 3 to 5, for example. It is also clear that the term "tilt" is used interchangeable with the terms "inverting" and "everting". In this regard the Examiner's attention is drawn to the first full paragraph on page 7 as filed, which describes how a device in accordance with the invention can be used to take a molding. The Examiner will note that lines 3 to 5 of this paragraph describe how the angle of tilt can be measured using the display 32 and goes on in the following sentence to describe how the plate can be inverted or everted by the required amount as indicated on the display. The Examiner will also note that the final sentence in the paragraph states that "the frontal plane angle of the foot is maintained at all times by

Date December 8, 2003**Reply to Office Action dated: October 6, 2003**

checking the liquid crystal display". Applicant submit that it is evident from the above referenced passage that the terms "tilt", "inversion" and "eversion" as used in the specification are intended to refer to movement of the foot in the frontal plane in accordance with the accepted medical definitions of the terms "inversion" and "eversion". Other specific references to the terms "inverting" and "everting" can be found on page 7 line 22 and page 8 line 11. The use of these terms is at all times consistent with the accepted medical definitions.

As further support for our assertion on the proper interpretation of the terms "inversion" and "eversion", the Examiner's attention is drawn to the first two embodiments of the invention as shown in Figures 1 to 5. In both of these embodiments the planar surface is mounted to a leg rest by means of a number of horizontal hinges and a single vertical pivot. See in particular figures 1 and 2. Due to this mounting arrangement, the planar surface 20 can move the foot in only two ways. The first is to apply a dorsiflexory pressure. This is movement in the sagittal plane and pushes the toes toward the shin. The other is to rotate the foot in the frontal plane, in other words to invert or evert the foot in accordance with the accepted medical definitions of these terms. In view of the physical constraints of these embodiments, it is submitted that references in the specification as filed to "tilting", "inversion" and "eversion" can only have been intended to refer to movement in the frontal plane of the foot in accordance with the medical definitions of these terms.

The Applicant is a Doctor in the field of Foot Orthotics and understands fully the meaning of the terms "inverting" and "everting" in the art. The Applicant wholly accepts the limitations to be placed on these terms, not only because the limitation is universally accepted in the art, as proven by the extracts discussed above, but more importantly because the invention would not achieve its function if the movement of the planar member was not capable of inversion and eversion in the frontal plane, in accordance with the specialized definitions.

It is important to note that whilst movement of the device in inverting or everting the foot is essential to the invention, the device is not limited exclusively

Date December 8, 2003

Reply to Office Action dated: October 6, 2003

to this movement. For example, it may also be necessary for dorsiflexory pressure to be applied to the foot using the planar surface of the device in addition to the movement of inversion or eversion. Other more complex 'composite' movements, which include the movement of inversion or eversion, may also be carried out, as required.

The above discussion clearly shows that the limitation to be placed on the terms "inverting" and "everting" in the claims of the present application is acknowledged in the art, and is narrower than the broad interpretation thus far placed on these terms by the USPTO.

As set out in our letter of November 3rd, 2003, Applicant believes that the apparatus which is the subject matter of the present application is fundamentally different from the prior art referred to in the Final Office Action. The prior art does not show an apparatus in which a planar surface is capable of being used maintaining contact with the sole of the foot to apply pressure thereto whilst the foot is inverted and everted, having regard to the universally understood definition of these terms in the art as discussed above.

During the telephone conference, the Examiner made specific reference to U.S. 4 886 258 (SCOTT), in relation to the claims of the present application. However, Applicant notes that the apparatus shown in U.S. 4 886 258 is not capable of moving the foot in the frontal plane and is therefore unsuitable for the purposes of the invention and does not anticipate claim 1 currently on file. Moreover, there is nothing in the teaching of U.S. 4 886 258 which would suggest the need for movement in the frontal plane. Therefore, the present invention is considered to be distinguished over this piece of prior art.

Summation of Telephone Interview of November 5, 2003:

A telephone interview was conducted on November 5, 2003 with the following conferees: Tania C. Courson (Patent Examiner), Diego Gutierrez (Supervisory Patent Examiner), Simon J. Church (Attorney), and Andrew Root (Applicant).

Date December 8, 2003

Reply to Office Action dated: October 6, 2003

During the telephone interview there was a discussion of all the claims, specifically claim 1. Also discussed was the prior art of *Sugarman et al.* (U.S. 4,443,005) and *Scott* (U.S. 4,886,258).

It was agreed that the Applicant has the option of providing support from the originally filed specification to indicate that the terms "inverting" and "everting" are terms that should be limited to only their medical definitions. The Applicant may further specify that it's commonly accepted to limit these terms to only their medical definitions. The Applicant was made aware that they may provide support for these medical definitions as long as they are not deemed new matter and/or new issue. Furthermore, the Applicant was made aware that at best this would overcome the prior art rejection, but there are other references (i.e. Scott, US 4,886,258, Fig. 3) that may be applicable to limiting the terms to only their medical definitions. If the Applicant's response is not persuasive, the Applicant is aware that the Examiner will issue an Advisory Office Action so that the Applicant can then take the necessary action to file a continuation or appeal.

It was also agreed that by deleting claims in their entirety would not be considered a new issue. If this is the case, the After Final Amendment would be entered upon filing an appeal brief. The Applicant should be aware that by deleting portions of claims would be considered a new issue.

Respectfully submitted,

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Dated: December 8, 2003

DPC/caod/dge

APPENDIX

- A. U. S. Patent No. 4,443,005 (sheet 2)
- B. "Foot Orthoses and Other Forms of Conservative Foot Care,"
Thomas C. Michaud
- C. "Biomechanical Basis of Human Movement," 2d Edition,
Joseph Hamill, Phd. and Kathleen Knutzen, PhD, Lippincott,
Williams & Wilkins.
- D. "Biomechanical Examination of the Foot," Library of Congress
Catalog Card No. 71-185067
- E. Various Web Pages

U.S. Patent

Apr. 17, 1984

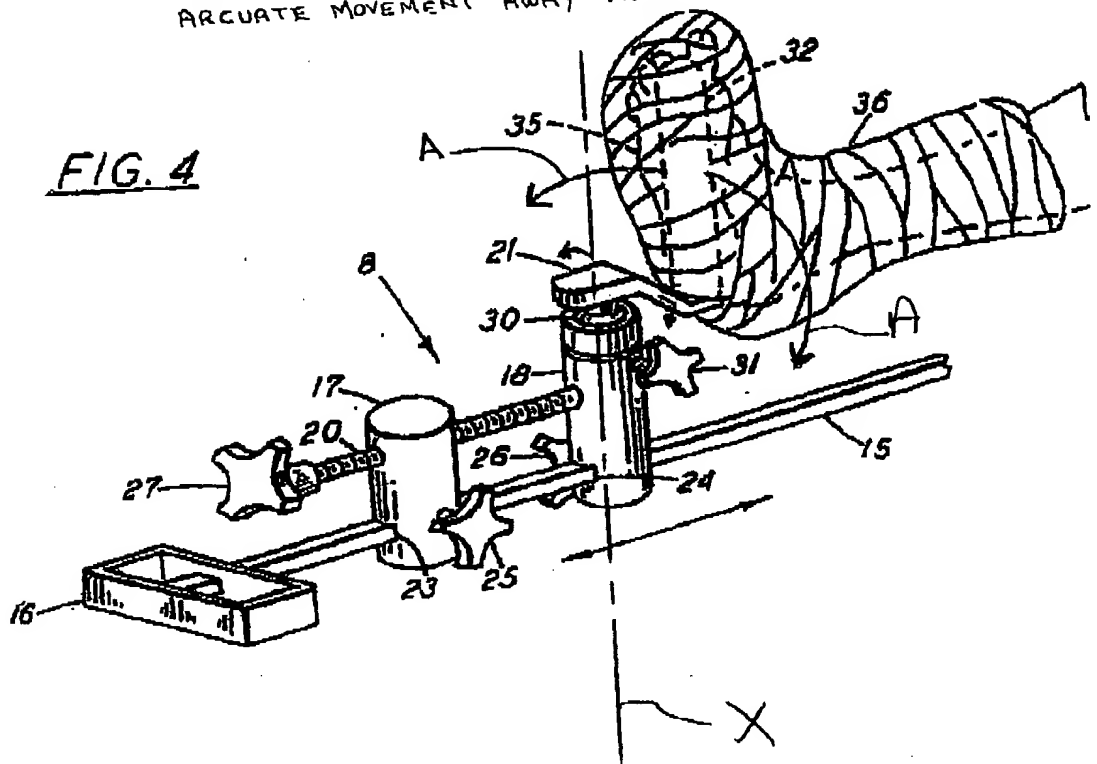
Sheet 2 of 2

4,443,005

SUGARMAN et al

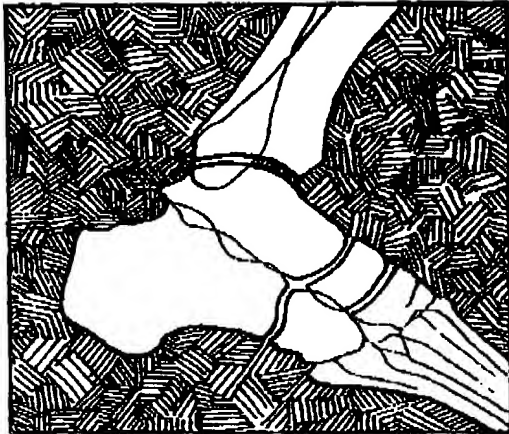
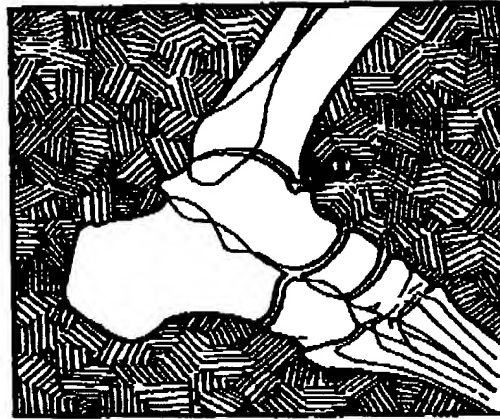
21 AXIS PRODUCES
ARCuate MOVEMENT AWAY FROM FOOT

FIG. 4



FOOT ORTHOSES

and Other Forms of Conservative Foot Care



Thomas C. Michaud

FOOT ORTHOSES

and Other Forms of Conservative Foot Care


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*Additional copies of this book may be
purchased from Dr. Thomas Michaud:*

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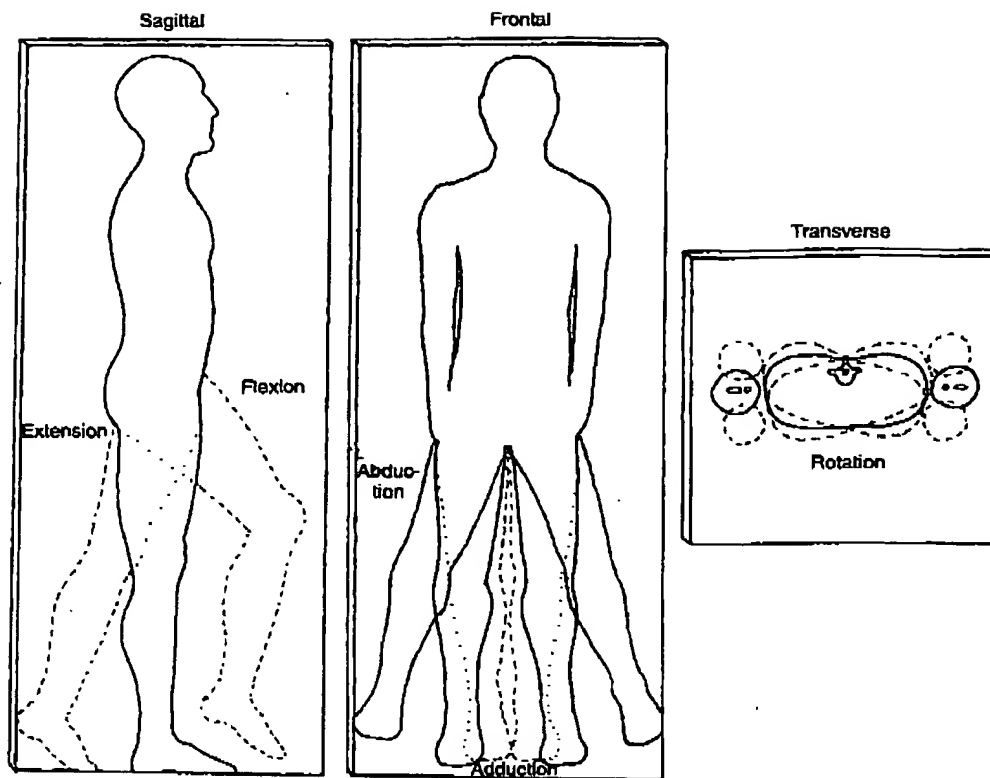


Figure 1.3. Body motions in each of the reference planes.

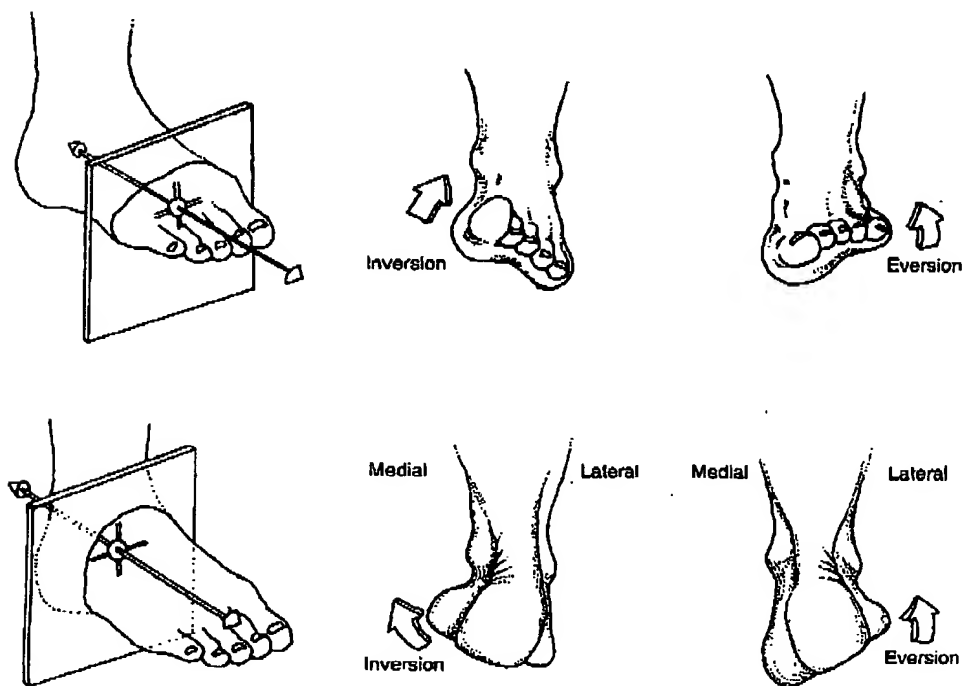


Figure 1.4. Frontal plane motions.

Human Movement



LIPPINCOTT WILLIAMS & WILKINS

Human Movement
Lippincott Williams & Wilkins

APPENDIX C

Biomechanical Basis of Human Movement

SECOND EDITION

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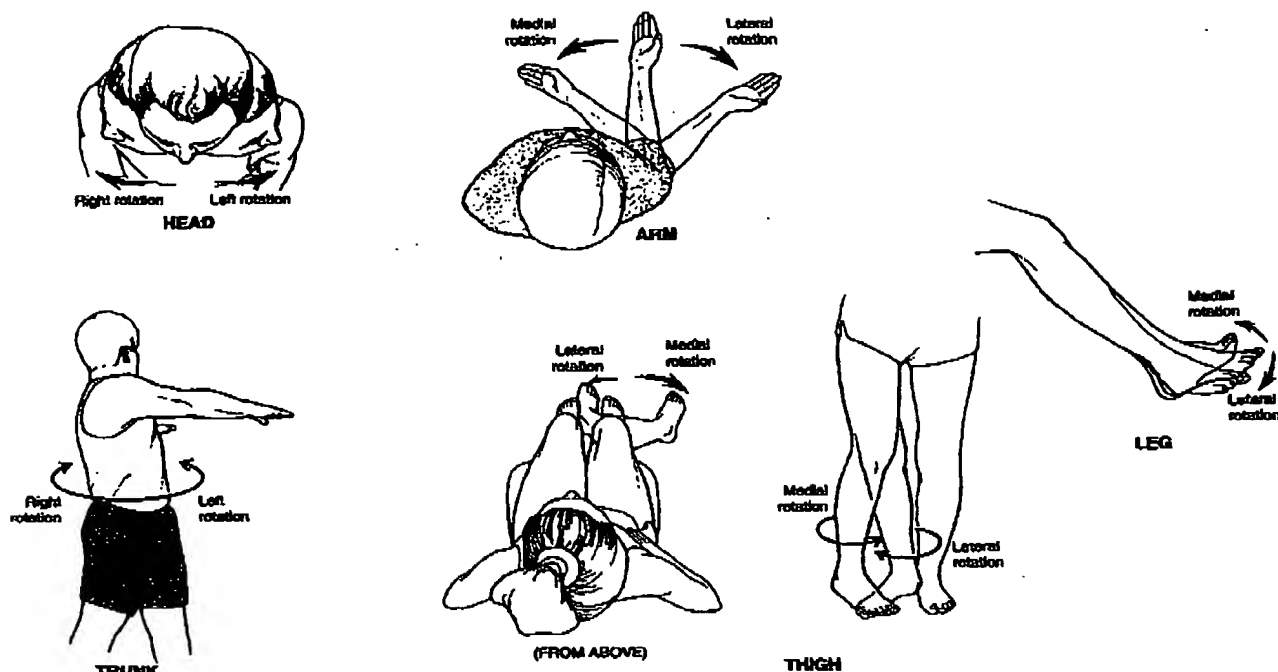


FIGURE 1-21 Rotation. Rotation occurs in the vertebral, shoulder, hip, and knee joints.

at the radioulnar joints. **Supination** is the movement of the forearm in which the palm rotates to face forward from the fundamental starting position. **Pronation** is the movement in which the palms face backward. Supination and pronation joint movements have also been referred to as external and internal rotation, respectively. As the forearm moves from a supinated position to a pronated position, the forearm passes through the semiprone position, in which the palms face the midline of the body with the thumbs forward. The actions of forearm pronation and supination are used with arm rotation movements to increase the range of motion, add spin, enhance power, and change direction during the force application phases in racket sports, volleyball, and throwing.

At the wrist joint, the movement of the hand toward the thumb is called **radial flexion**, while the opposite movement of the hand toward the little finger is called **ulnar flexion**. These specialized movement names are easier to remember because they do not depend on forearm or arm position, as do the interpretation of abduction and adduction, and they can easily be interpreted if the location of the radius (thumb side) and the ulna (little finger side) is known. Ulnar and radial flexion are important in racket sports for control and stabilization of the racket. Also, in volleyball, ulnar flexion is a valuable component of the forearm pass, as it helps to maintain the extended arm position and increases the contact area of the forearms.

In the foot, **plantarflexion** and **dorsiflexion** are specialized names for foot extension and flexion, respectively. **Plantarflexion** is the movement in which the bottom of the foot moves down and the angle formed between the foot and the leg increases. This movement can be created by raising the heel so the weight is shifted up on the toes or by placing the foot flat on the ground in front and moving the leg backward so that the body weight is behind the foot. **Dorsiflexion** is the movement of the foot up toward the leg that decreases the relative angle between the leg and the foot. This movement may be created by putting weight on the heels and raising the toes or by keeping the feet flat on the floor and lowering with weight centered over the foot. Any foot-leg angle greater than 90° is termed a plantarflexed position, while any foot-leg angle less than 90° is termed dorsiflexion.

→ The foot has another set of specialized movements, called **inversion** and **eversion**, that occur in the intertarsal and metatarsal articulations. **Inversion** of the foot takes place when the medial border of the foot lifts so that the sole of the foot faces in toward the other foot. **Eversion** is the opposite movement of the foot: the lateral aspect of the foot lifts so that the sole of the foot faces away from the other foot.

BIOLOGICAL EXAMINATION OF THE FOOT

VOLUME 1

BY ROBERT L. BERRY, EDEN - WILLIAM P. CANNON, EDEN
JAMES H. JONES, DPH - ROBERT A. KADDER, EDEN

BIOMECHANICAL EXAMINATION OF THE FOOT

VOLUME 1

BY
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JOHN H. WEED, DPM
ROBERT J. HUGHES, DPM

ILLUSTRATED

CLINICAL BIOMECHANICS CORPORATION, PUBLISHERS, LOS ANGELES



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Dr. Root is presently in private practice in San Jose, California. He is a nationally known lecturer and teacher of clinical biomechanics of the foot. His original clinical investigation, and correlation with the basic research of others, provides the basis for this text.

Dr. Root was Director of the Department of Biomechanics; and Professor of Clinical Orthopedics of the California College of Podiatric Medicine in San Francisco, California, prior to his retirement to private practice in 1968.

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Dr. Hughes is the author of "Doctor Pod.", and "Quiet Please." He is the illustrator of this text.

BIOMECHANICAL EXAMINATION OF THE FOOT

IN MEMORY OF MARGARET M. DOWNEY, D.P.M.,
FOR HER CONTRIBUTION TO
BIOMECHANICS THROUGH RADIOLOGY.

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Designed by David Neil

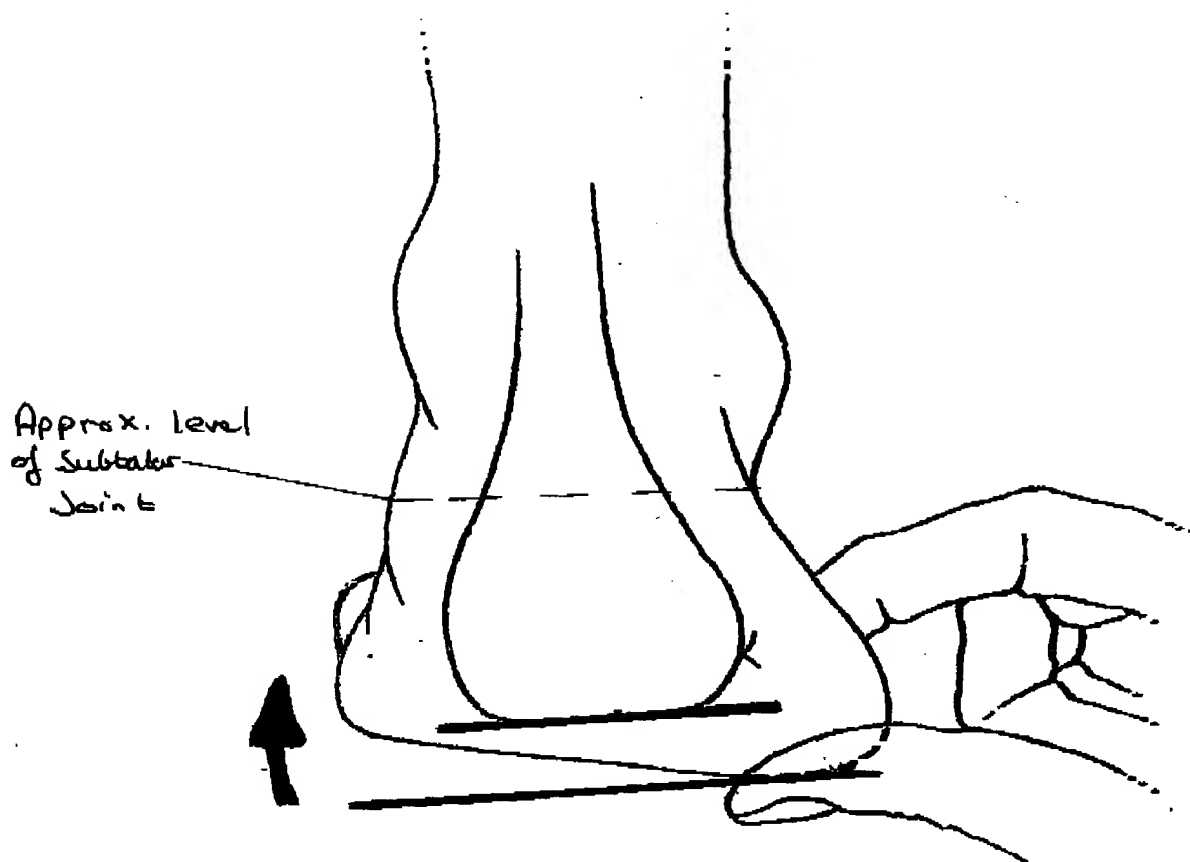
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MOTION IN THE FOOT

INVERSION: Motion occurring in a frontal plane, during which the plantar surface of the foot or part of the foot is tilted so as to face more toward the midline of the body. The axis of this motion lies in the sagittal and transverse planes. (Fig. 6)

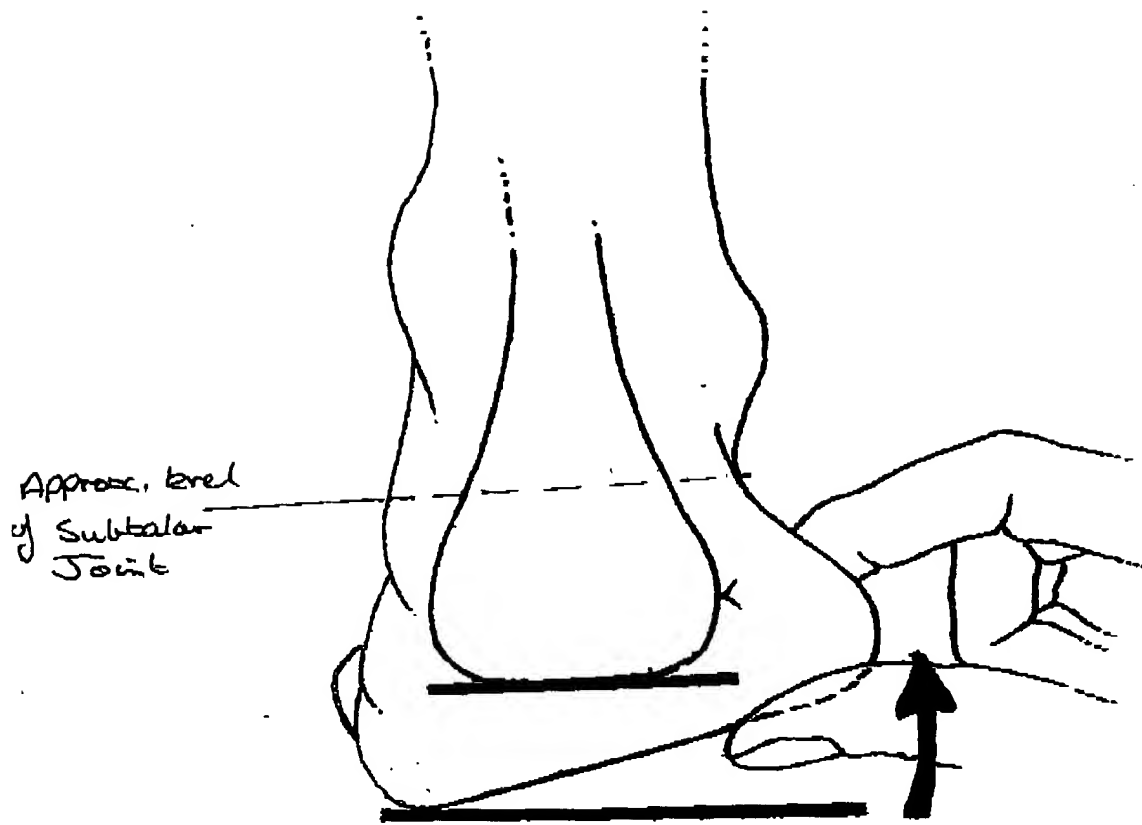
EVERSION: Motion occurring in a frontal plane, during which the plantar surface of the foot or part of the foot is tilted so as to face further away from the midline of the body. The axis of this motion lies in the sagittal and transverse planes. (Fig. 7)

INVERSION OF FOREFOOT



RIGHT FOOT

EVERSION OF FOREFOOT



RIGHT FOOT



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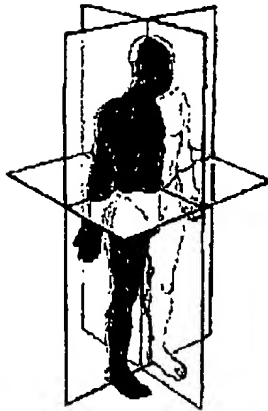


Figure 1.3
Transverse, Frontal and Sagittal planes.

BASIC ANATOMIC TERMS

There is a "language" used by medical practitioners of all kinds (chiropractors, orthopaedic surgeons, nurses, etc.). When discussing the body and its ailments the basic terms you will need to know are:

1. **Proximal and Distal** - "proximal" means closer to the heart and "distal" means further away from the heart. Thus, each toe has three bones: the proximal phalanx, the middle phalanx, and the distal phalanx (except the big toe).
2. The three anatomical planes: transverse, frontal and sagittal - there are three planes which divide a body and are used as points of reference.

A. Transverse: divides top and bottom.

B. Frontal: divides front and back.

C. Sagittal: left and right.

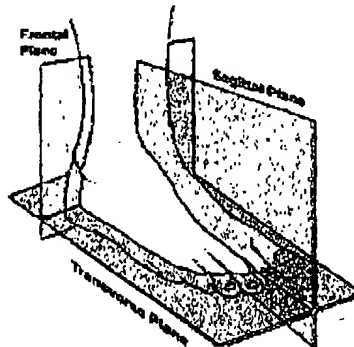


Figure 1.4
Anatomical planes with respect to the foot.

3. The three single plane motions of the foot:

1.

Abduction and adduction: these occur in the

transverse plane. The foot abducts when it rotates laterally (i.e. away from the centre). It adducts when it rotates medially (i.e. towards the centre.)

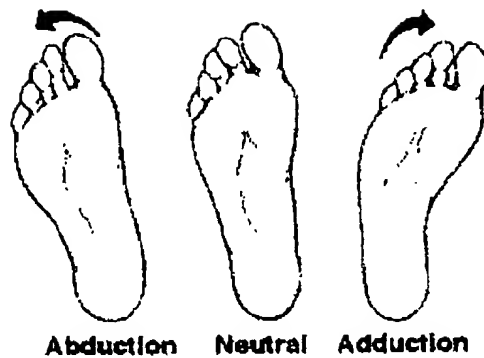


Figure 1.5
Single plane motion of the foot.

2. **Inversion and eversion:** These movements occur in the frontal plane. The foot inverts when it twists inward and upward (the sole toward the midline), and everts when it twists outward and upward (the sole away from the midline).

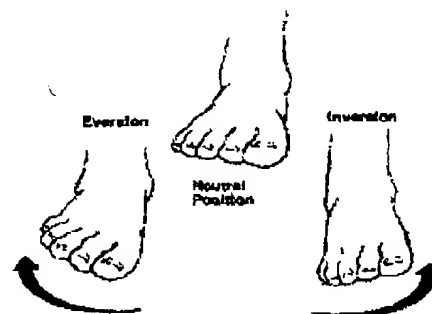


Figure 1.6
Single plane motion of the foot
Inversion and eversion of the foot (right foot).

3. **Plantarflexion and dorsiflexion:** These movements occur in the sagittal plane. The foot plantar flexes when it moves downwards away from the tibia and dorsiflexes when it moves upwards toward the tibia.

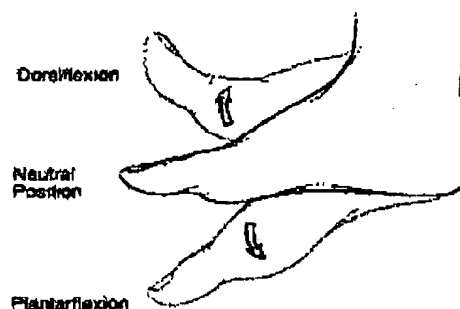


Figure 1.7
Single plane motion of the foot
Dorsiflexion and plantarflexion of the foot (right foot).

- **Pronation and Supination:** There are two motions of the foot, pronation and supination,

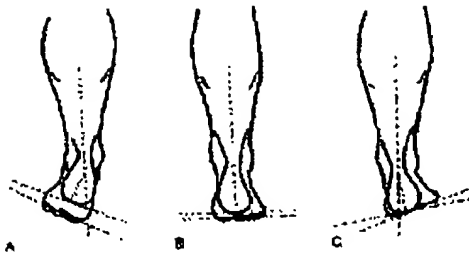


Figure 1.10: Right Foot

a) The STJ and foot in a supinated position. b) the STJ and foot in the neutral positions. c) The STJ and foot in a pronated position.

5. **Lateral and Medial** - Lateral means on the side away from the mid-line sagittal plane and medial means on the side closer to the mid-line sagittal plane.
6. **Dorsum and Plantar surfaces** - The dorsum of the foot is the top part of the foot. The plantar surface of the foot is the sole of the foot.
7. **Positions of the foot:**
 - a. **Dorsiflexed and Plantarflexed:** In the normal foot, the reference point for a dorsiflexed or plantarflexed position is a transverse plane which runs through the heel. If the foot is positioned below this transverse plane, it is said to be plantarflexed; above this transverse plane, it is said to be dorsiflexed.
 - b. **Everted and Inverted:** A foot or part of a foot is said to be **inverted** when it is tilted parallel to a frontal plane so that the plantar surface of the foot or part faces toward the midline of the body. A foot or part of the foot is said to be **everted** when it is tilted parallel to a frontal plane so that the plantar surface faces away from the midline of the body.
 - c. **Abducted and Adducted:** The two transverse plane positions of the foot are **abducted** and **adducted**. The reference point is the mid-line sagittal plane.
8. **Fixed structural positions of the foot** - due to the inherent structure of bone, ligament, etc. of a particular foot:
 - a. **Adductus and Abductus:** Adductus denotes a fixed structural position in which the foot is held in an adducted position in the transverse plane. Abductus denotes a fixed structural position in which the foot is held in an abducted position in the transverse plane.
 - b. **Varus and Valgus:** the two frontal plane fixed structural positions which the foot may assume relative to the inverted and everted positions. The **fixed structural position** in which the foot or part of the foot appears inverted is classified as **varus**. The fixed structural position in which the foot or part of the foot appears everted is classified as **valgus**.

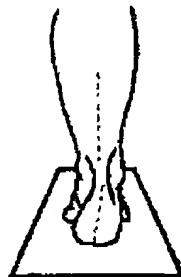


Figure 1.11

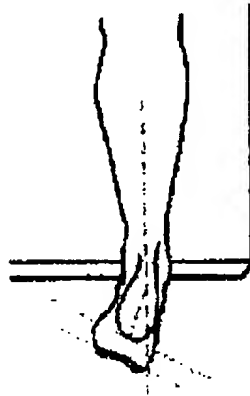
which include simultaneous movement in the frontal, sagittal, and transverse planes.

Pronation is a triplane motion consisting of simultaneous movements of eversion, abduction, dorsiflexion.



*Figure 1.8
Pronated foot (right foot).*

Supination is a triplane motion which combines the movements of inversion, adduction, plantarflexion.



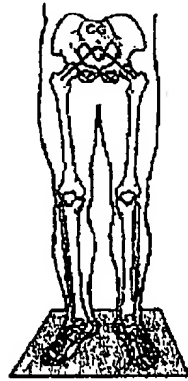
*Figure 1.9
Supinated foot (right foot).*

It is difficult to clinically measure a triplane motion in the ankle at the subtalar joint ("STJ"). Therefore, frontal plane motion is used as an index to measure triplane motion at the STJ. The number of degrees of inversion or eversion in the frontal plane signify the amount of pronation and supination.

The foot must adapt for variance in the terrain (it must be a "mobile adaptor"), which occurs with pronation (the foot is a "loose bag of bones" in pronation). It must also serve as a "rigid lever" to propel the body forward in space. The latter occurring when the foot is supinated, as the foot structure becomes more rigid when supinated.

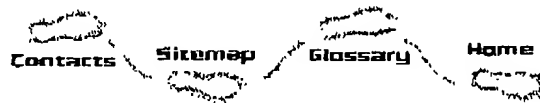
*Uncompensated (non-weight bearing)
Rearfoot Varus (right foot).*

THE ANATOMY OF THE LOWER LIMB



*Figure 1.12
The skeletal structure of the pelvis, leg and foot
including the 26 bones of the foot.*

The function of all of the muscles in the lower limb originating below the knee is to move the foot. These muscles insert on any one or several of the 26 bones of the foot.



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anatomy

movement-terms

supination--pronation--inversion--eversion

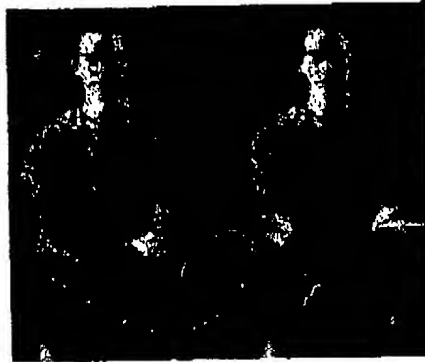
Where actions are not exclusive to one joint, each should involve the joint name in the movement term; this creates a more descriptive term. Movements are assumed to be from the anatomical position, unless otherwise informed.

- * Supination - Medial rotation of the forearm at the Radio Ulna joint, so the palms face up.
- * Pronation - Lateral rotation of forearm at the Radio Ulna joint, so the palms face down.

Supination & Pronation can also be found at the ankle. (see Anatomy of the foot)



Opposition



Supination Pronation



Inversion Eversion

other movements local to the foot are Inversion & eversion

- * Inversion - Twisting of the foot so that the sole faces inward.
- * Eversion - Twisting of the foot so that the sole faces outward.



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